

## ES202 LAB EXERCISE - INTRODUCTION TO TOPOGRAPHIC MAPS

(updated Feb. 2129, AGI Lab Manual 9<sup>th</sup> Edition)

### Part 1 - Refer to the lab manual for the following questions.

1-1. What are the latitude and longitude coordinates of points A and B in **Figure 9.1, p. 197?**

1-2. Using a protractor, what is the azimuth compass bearing from point C to point D in **Figure 9.4, p. 201?** How about from point D to point A?

1-3. In **Figure 9.5 (p. 203)**, locate points X and Z using the Township-Range-Section method of location (Public Land Survey System).

	X	Z
Township	_____	_____
Range	_____	_____
Section	_____	_____

1-4. Referring to **Figure 9.5B**, how many acres are covered in 1 section (1 square mile = 640 acres)?

1-5. Complete the topographic map depicted in **Activity 9.1 Item I (p. 220)**. Label each contour line using a contour interval of 10 feet. Start with 0 m elevation at sea level.

1-6. Refer to **Activity 9.2 Item J (p. 221)**, Read the instructions and **complete the tasks 1-5**.

1-7. Read and review the topographic profile instructions presented in **Figure 9.14, p. 213**. Using the example topographic map in **Activity 9.2 (p. 222)**, draw a topographic profile along line A-A'. Plot your profile on the graph paper provided in the lab manual. Start with an elevation of 500 ft at the origin of the y-axis, and use a vertical scale of 1 in = 100 ft.

A) What is the horizontal fractional scale of the map?

B) What is the fractional scale of the vertical axis of your profile (hint: convert 1 in = 100 ft to a dimensionless fractional scale)?

C) Refer to the example on p. 163 of your lab manual ("step 4") and determine the vertical exaggeration of your profile.

1-8. Complete the tasks **for Activity 9.1 (p. 219), items A, B and E**.

1-9. Using a contour interval of 10 ft, draw the following contour lines for the spot elevation data provided on **Activity 9.1H (p. 220)**: 80 ft, 90 ft, 100 ft, 110 ft, 120 ft, 130 ft, 140 ft.

1-10. Using a contour interval of 100 feet, draw the following contour lines for the spot elevation data provided on **Activity 9.1G (p. 220)**: 100, 200, 300, 400, 500, 600.

**Part 2. - Refer to the Monmouth Quadrangle (maps located on table in lab)**

2-1) What is the fractional scale, contour interval, and magnetic declination of this map?

a) Scale:                                      b) Contour Interval:                                      c) Declination:

2-2) What quadrangle maps are located immediately adjacent to the Monmouth Quad.?

a) North:                                      b) South:                                      c) East:                                      d) West:

2-3) What is the quadrangle size series of this map (in long. and lat.)?

2-4) What is the date of publication of this map?

2-5) What is the name of the major river system flowing through this area. Of What larger drainage basin(s) does this river form a part of?

2-6) What is the approximate elevation of the Natural Sciences Building based on the map representation?

2-7) Given the fractional scale determine the following

5 inches on the map= \_\_\_\_\_ Feet on ground = \_\_\_\_\_ Miles on ground.

10 inches on the map= \_\_\_\_\_ Meters on ground = \_\_\_\_\_ Kilometers on ground.

2-8) A. What is the road distance in miles along Rt. 99 between Helmick State Park and Monmouth city limits?

B. What is the distance in kilometers?

2-9) A. What is the highest point of elevation represented on this map?

B. What is the lowest point of elevation represented on this map?

C. What is the maximum relief.

2-10) A. What is the longitude and latitude location of the road intersection at Buena Vista

B. What is the longitude and latitude location of Davidson Hill?

C. What is the straight line distance in miles between these two points?

D. What is the azimuth bearing FROM Davidson Hill TOWARDS Buena Vista?

E. What is the quadrant bearing FROM Buena Vista TOWARDS Davidson Hill?

2-11) A. What is the nature of the topographic slope in the vicinity of the town of Monmouth? What is the local relief between WOU and the Willamette adjacent to Independence?

2-12) Determine the elevations of the following locations:

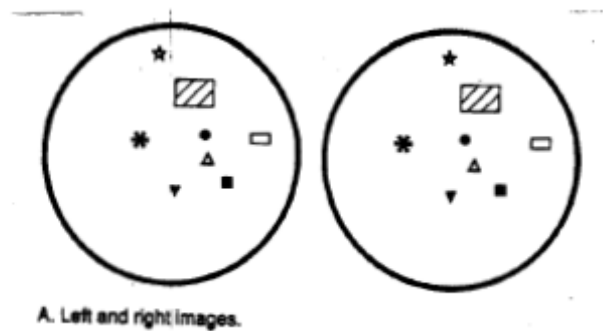
A. Wigrich

B. Oak Hill (SC)

### Part 3 - Introduction to Aerial Photographs

3-1. Read over p. 215-216 in your lab book, and provide a general discussion as to what air photos are, and how are they used to obtain 3-D stereoscopic views.

3-2. Test of Stereo vision: to test your ability to see in 3-D, use a student pocket stereoscope and view the image below. Observe the apparent height of the shapes, and rank from highest = 1, to lowest = 8.



3-3. Refer to Air Photo Station 1 in the lab. View the images in stereo and answer the following questions.

- What is the dominant type of surface environment? (fluvial, glacial, coastal, or other?)
- What is the dominant type of climate (warm or cold? wet or dry?)
- Is this area vegetated or non-vegetated?
- Do you see evidence for human landuse? If so, list your observations.
- Hypothesize as to what you think the cone-shaped geologic feature is in the lower right of the photograph.
- Hypothesize as to where you think these photos were taken in the U.S.. What is your line of reasoning?

3-4. Refer to Air Photo Station 2 in the lab. View the images in stereo and answer the following questions.

A. What is the dominant type of surface environment? (fluvial, glacial, coastal, or other?)

B. What is the dominant type of climate (warm or cold? wet or dry?)

C. Is this area vegetated or non-vegetated?

D. Do you see evidence for human landuse? If so, list your observations.

E. Hypothesize as to what you think the dominant mode of surface erosion is in this area. What is your evidence?

F. Hypothesize as to where you think these photos were taken in the U.S. What is your line of reasoning?.

3-5. Refer to Air Photo Station 3 in the lab. View the images in stereo and answer the following questions.

A. What is the dominant type of surface environment? (fluvial, glacial, coastal, or other?)

B. What is the dominant type of climate (warm or cold? wet or dry?)

C. Is this area vegetated or non-vegetated?

D. Do you see evidence for human landuse? If so, list your observations.

E. Hypothesize as to what you think the horseshoe shaped objects are in the center of the photo. How might they form?

F. Hypothesize as to where you think these photos were taken in the U.S.. What is your line of reasoning?

3-6. Using the “pocket stereoscopes” available in the lab, complete Activity 9.6 **questions “A” and “B” in your lab manual on p. 226, referring to Fig. 9.17 on p. 217.**